Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

have the antennæ alike in both sexes, but in Philopteridæ the third segment of the antennæ of the male has a lateral process, sometimes so large as to make the antenna resemble a lobster's claw. Nitsch states that it is for holding the female.

Eyes.—These lie on the margin of the under surface of the head behind the antennæ. Authors have hitherto ascribed a single pair of eyes to all Mallophaga. But in all Philopterid genera examined (Goniodes, Docophorus, Lipeurus, Nirmus) the author found a single pair, and in all Liotheid genera (Tetrophthalmus, Læmobothrium, Menopon, Trinotum and Colpocephalum) he found two pairs of stemmata. If this character holds good for the remaining genera it will still further separate the two chief divisions of the Mallophaga.

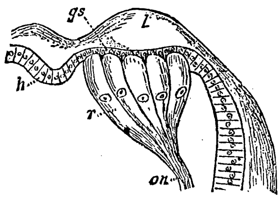

FIG. 10.—Eye of Læmobothrium seen on cross-section of head. × 190.

The eyes of Mallophaga are simple, provided with a lens-shaped thickening of the cuticle. In young specimens the eye has no pigment, but in older specimens it has pigmented retinal cells. The eye of Læmobothrium, examined by means of sections, has, under the chitin-thickening (Fig. 10 *l*), twenty-four pigmented retinal-cells (*r*), clavate and nucleated with nucleoli, merging gradually into the pigmented optic nerve (*on*). Each eye is directly innervated from the preœsophageal ganglion. The hypodermal cells are interposed between the lens and the retinal-cells, as cubic cells in old specimens, but as a hyaline body consisting of cylindrical cells in young or recently molted specimens. There are no rhabdites in the eyes. The eyes of Mallophaga resembles those of *Phryganea grandis*, as described by Grenacher.

——:o:——

TRACK OF A CYCLONE WHICH PASSED OVER WESTERN INDIANA MORE THAN THREE HUNDRED YEARS AGO.

BY JNO. T. CAMPBELL.

LAST April (1885) I was surveying in the west-central part of Parke county, Indiana. On the south side of Section 16, Township 15 north, of Range 8 west, I noticed that the tree graves were very numerous, there being one to every square rod of ground. I noticed that they all indicated that the storm which caused them was going to the north-east. When a tree is blown down the roots hold two to five cubic yards of earth in their grasp, which makes a corresponding pit where the tree stood; after the fallen tree has entirely rotted, the earth held by the roots leaves a mound resembling an old grave, and have been very commonly called by people here, "Indian graves." The mound is always on the side of the pit toward which the tree fell.

This storm track was about one thousand feet wide. I at that time followed it nearly one mile. Just before I ceased tracing it I found the stump of a white oak, cut down during the year 1884, standing on top of one of the tree graves or mounds. I counted the rings of growth and found it to have been two hundred and ninety-seven (297) years old. That settled the fact that the storm had passed over the ground at least three hundred and ten years before; for the acorn could not sprout on the mound until the tree had first been blown down; and second, it could not sprout till the fallen tree had also rotted away, and left the mound sufficiently flattened for moisture to rise to its top surface.

On the 18th of May following I was surveying in Section 29 and 30, Township 15 north, of Range 8 west (which surveyors in the West will understand is about three miles to the south-west of the first place mentioned). Here I also found the tree graves as thick as the grown trees now are, and they also indicated that the storm which blew down the trees which made these tree graves, was going to the north-east. A moment's reflection also showed me that this was on the same line or track of the one first observed.

After I returned home I placed a string on my county map so as to cover these two locations, and noted carefully what points across the county the string touched. I noticed that by extending the string south-westward it passed about one-half to three-quarters of a mile to the right of Clinton, in the south end of Vermilion county, which adjoins this county on the west, the Wabash river lying between them. Clinton stands on the west bank of this river. I at once remembered that when a boy in my early "teens" I had lived with a Dr. Kile, two and a half miles south-west of Clinton, and in my frequent trips to town I often noticed the tree graves, which in my simplicity then I supposed to be in fact real "Injun graves." They were very numerous, and I supposed there had been a great battle between two hostile tribes of Indians, and that these mounds were the graves of the unknown braves. There were not the very faintest trace of fallen trees in connection with these graves, so thoroughly had they rotted away. I found by applying the string to the map that these graves were in a line with those I had recently found in this (Parke) county.

On the 8th of July following (1885) I was making a survey in the north-east part of the county, in Section 29, Township 17 north, of Range 6 west. While at the dinner table I told one of the land proprietors that I had recently got upon the track of an ancient storm which, if it had kept on the course I had observed should pass over the ground we were then eating our dinner on. I asked him if he had ever noticed any trace of it. He said, "Yes. When I was a boy and young man the 'Indian graves' out in that field [pointing south-eastward] were so thick that I could jump from one to another all over that part of the farm." I asked what course the storm was going, and explained how he would know by the position of the mound in relation to the pit. He said north-east, and told me what farms it crossed, and about where it crossed the county boundary into Montgomery county, which was close by. This was over fifteen miles from where I had first discovered the track, and I had not missed its location where I am now speaking about more than seven hundred feet.

The next day I was going to another part of the county, and had to travel south-westward several miles, and crossed the storm track. I saw a man in the edge of a field harvesting. I told him what I had discovered, and asked him if he had ever noticed it. He answered, "Yes. When I was a boy the Indian ('Injun') graves just below that sugar camp [grove of sugar maples] were as thick as stumps in a new clearing. We boys used to count them to see how many Indians had been killed in battle." It was the general belief of the children of the early settlers that these were Indian graves, and that where they were numerous, as in a storm track, that there had been a battle between tribes. The place he pointed out was in the track I was looking after.

I may here remark that after the land is cleared and cultivated, the plow in a very few years destroys all trace of these graves. Hence my inquiries of persons who had known the country from the days when it was an unbroken forest.

This storm would pass, in going north-east, about two miles to the left of the city of Crawfordsville, Indiana, the county-seat of Montgomery county. Though it might change its course farther on.

At, or very near the spot where I counted the age of the oak which had grown on one of these tree graves, there still stands on another mound a white oak considerably larger than the one I counted, though it may not be an older one. I have delayed writing this account over six months, expecting a miller to cut this larger tree so I could count its age, but it has been neglected so long that I have decided to write from what information I now have.

These tree graves are, in the wild forest, as well preserved and as distinct in outline, although more than three hundred years old, as many that have been made by trees that have fallen within my own recollection. If the same conditions that have so well preserved them for that time should continue in the long future, I see no reason why these mounds might not be preserved five thousand, yea, ten thousand years.

What does the reader guess has so well preserved these little mounds for so long a time? It is nothing more nor less than a thin coating of forest leaves. The leaves act as shingles in shedding the rains, so that they are not washed or worn down by the falling rain or melting snow. The frost does not penetrate through a good coating of leaves, and therefore they are not expanded and spread out by freezing and thawing. I can see a great difference between the mounds in the wild forest and those on land that has been set to grass and pastured a few years. The tramping of stock and the frequent expansions from freezing, which the grass does not prevent, flattens them perceptibly. The grass, however, does preserve them against rain-washings. When a belt of forest is blown down there are no trees to produce leaf shingling till a new set are produced; but these come in great abundance in ten years. It requires about fifteen to twenty years to rot a sound white oak. The time will depend on the lay of the log, whether it falls across another log and lies above ground, or lies on or is partly bedded in the ground.

I now offer a conundrum in connnection with this subject for whomsoever may feel an interest in it to solve. I have partly solved it myself, but not entirely to my satisfaction. I have, after much observation, noticed that not more than one-tenth of the surface of the present forests show any trace whatever of any storms, recent or ancient. If storms have been as frequent and as destructive in the past as in my day (of fifty-three years), and the elements of preservation of the mounds have existed in the past as now, why do I find so few storm tracks as I have mentioned? It would seem that in three hundred years, if storms had always been as frequent as in our time, and in the same haphazard manner, there would not be a square rod of ground that would not show some trace of a storm.

I give my explanation for what it may be worth, but is short of all the facts of explanation. I am able to say of the storm I have described, with as much confidence as if I had been present and seen it: First, that it occurred when the trees were in full leaf; second, that there had been a protracted rain; third, that many of the trees blown down were white oak; fourth, that one was a large poplar; and fifth, that very few, if any at all were black walnut. And for the following reasons: The *great* storms do not now occur before the leaves are on. Without the resistance against the wind offered by the leaves, it is very hard for any storm to uproot a green tree. If the ground is dry and hard, or frozen, the trees will break off at or above ground. And in such case they would leave no tree graves, which may account for the few tracks I find. An oak leaves a deep, round pit and a plump, round mound. A poplar leaves a broad, shallow pit and a long, slender mound. The black walnut is very rarely "blown up by the root." I have seen this country from an unbroken forest to the present time, when four-fifths of the land is cleared for the plow or pasture, and I don't remember that I ever saw a black walnut blown up by the root. I have seen many broken off. They have a very firm root, and are, when mature, a little doughty at the stump, but very sound from ten feet above ground upward.

I have seen and still know of other large trees which stand on the graves of former fallen trees. Some of these trees are very large, but the size of a tree is such an uncertain indication of its age, that I can't say with much certainty how long the mounds, on which they stand, have existed. One thing is certain, the mounds are older than the trees. At the Fair ground, a mile west of where I am writing (Rockville, Indiana) are several such cases, and on the grounds of the now growing famous resort in our county, "Turkey run," or as it is called by people away from here, "Bloomingdale glens," are several such cases.

In a future article I shall show how the forest leaves have preserved the sides of hills and thus allowed the small streams to cut out the bottoms of the hollows deep, steep and sharp, which are rapidly changing since the country has been cleared and farmed. Also how they have preserved the ancient beds of streams along the terrace bottoms of the Wabash river and its principal tributaries till they are as sharply defined after the lapse of no one can venture to guess how many thousands of years, as they were when the last great final flood that cut out the beds swept over these plains.

I have said the storm here described was a cyclone. This I infer from the way the trees had fallen. In some parts of the track the trees were thrown in every direction, and the course of the storm could only be determined by the general course of the track, and not by the fall of individual trees.

The course of this storm is N. 44° 30′ E. in this county. In all my recollection of storms I never saw but one (in 1883) which bore so much to the north, and that one was the most threatening and awful in its appearance I ever saw, and did in localities much damage. Its course was about N. 37° E., or about 7° 30′ more north than the ancient one. The great majority of the storms I have seen, and of those which have left plain tracks, are from a few degrees north to a few degrees south of west.

——:o:——

ON THE MOUNTING OF FOSSILS.

BY FRANKLIN C. HILL.

THE five expeditions which have gone to the far West from Princeton have brought in many valuable fossils—invaluable is perhaps the better word—chiefly remains of vertebrates.

For the double purpose of utilizing and of preserving these treasures they have been mounted in a manner new in this country, and it is believed not common abroad, though somewhat practiced there.

The leading idea of the system is that each piece shall be set up in its natural position.

Our museum now contains nearly 400 such specimens, which